WE CLAIM:

1.An energy conversion device for transforming mechanical movement into electrical energy, comprising:

a coil, and

a magnetic assembly including a magnet disposed for reciprocable movement to create a moving magnetic field relative to said coil,

said coil configured to couple electrical energy out of said device upon relative movement between said magnet and coil,

wherein said device has a critical angle of displacement from a horizontal static position of less than 1 degree.

2. The energy conversion device of claim 1, wherein said critical angle is less than 10 minutes.

3. The energy conversion device of claim 1, further comprising a ferrofluidic bearing supporting said magnet.

4. The energy conversion device of claim 3, wherein said magnetic assembly further includes a polymeric race enveloping said magnet.

5. The energy conversion device of claim 1, suspended for movement upon application of a perturbation force.

6. The energy conversion device of claim 1, said assembly including a sealed tube housing said magnet.

7. An electrical generator, comprising:

a conductor,

a support structure,

a magnet constrained by said support structure for movement relative to said conductor, and

a ferrofluid disposed between said magnet and support structure to provide a low friction interface,

said conductor arranged with respect to said magnet so that relative motion between the magnet and conductor generates an electrical signal in said conductor.

8. The electrical generator of claim 7, further comprising a pair of end magnets on opposite sides of, and opposing polarity to, said magnet to limit said magnet's motion.

9. The electrical generator of claim 7, said support structure including a raceway for said magnet.

10. The electrical generator of claim 7, wherein said support structure is arranged for said magnet to move in response to a generally horizontal movement of the support structure.

11. The electrical generator of claim 7, wherein said support structure is arranged to be carried by a person and for said magnet to move in a reciprocating motion in response to motion of the person.

12. The electrical generator of claim 7, wherein said ferrofluid has a viscosity less than 5 centipoise.

13. The electrical generator of claim 7, wherein said ferrofluid comprises a light mineral oil medium mixed with isoparaffinic acid.

14. The electrical generator of claim 1, further comprising circuitry for coupling energy from said conductor out of said generator.

15. An electrical generator, comprising:

a magnet constrained to move relative to an enclosure,

a ferrofluid disposed between said magnet and enclosure to provide a low friction interface, and

a conductive coil disposed with respect to said magnet so that movement of said magnet relative to the coil generates an electrical signal in said coil.

16. The electrical generator of claim 15, wherein said coil is disposed along a portion of said enclosure which is traversed by said magnet's movement.

17. The electrical generator of claim 15, wherein said magnet is arranged with respect to said enclosure to provide an air flow path between opposite sides of the magnet when the magnet moves.

18. The electrical generator of claim 17, wherein said magnet is inside said enclosure and occupies less than the full interior cross-sectional area of said en-

closure, providing said air flow path around the periphery of said magnet.

19. The electrical generator of claim 15, wherein said enclosure is generally tubular.

20. The electrical generator of claim 15, further comprising a pair of end magnets on opposite sides of, and opposing polarity to, said magnet to limit said magnet's movement.

21. The electrical generator of claim 15, wherein said support structure is arranged for said magnet to move relative to the support structure in response to a generally horizontal movement of the support structure.

22. The electrical generator of claim 15, wherein said support structure is arranged to be carried by a person and for said magnet to move in a reciprocating motion relative to the support structure in response to motion of the person.

23. The electrical generator of claim 22, wherein said enclosure is curved.

24. The electrical generator of claim 15, wherein said enclosure is housed in a buoyant outer enclosure for relative movement between said magnet and coil that generates an electrical signal in said coil when said outer enclosure is floating on a liquid and subjected to wave action.

25. The electrical generator of claim 15, further comprising a suspension system for suspending said enclosure so that the enclosure moves and causes said magnet to generate an electrical signal in said coil in response to wind striking the enclosure.

26. The electrical generator of claim 15, wherein said ferrofluid has a viscosity less than 5 centipoise.

27. The electrical generator of claim 15, wherein said ferrofluid comprises a light mineral oil medium mixed with isoparaffinic acid.

28. The electrical generator of claim 15, further comprising circuitry for coupling energy from said coil out of said generator.

29. A battery charging system, comprising:

a conductor,

a battery contact,

a support structure,

a magnet constrained by said support structure for movement relative to said conductor, and

a ferrofluid disposed between said magnet and support structure to provide a low friction interface,

said conductor arranged with respect to said magnet so that relative movement between the magnet and conductor generates a battery charging signal in said conductor, said conductor connected to supply said battery charging signal to said battery contact.

30. The battery charging system of claim 29, further comprising a rectifying circuit, said conductor connected to supply said battery charging signal to said battery contact through said rectifying circuit.

31. The battery charging system of claim 19, wherein said ferrofluid has a viscosity less than 5 centipoise.

32. The battery charging system of claim 31, wherein said ferrofluid comprises a light mineral oil medium mixed with isoparaffinic acid.

33. A battery charging system, comprising:

a coil,

a battery contact, and

a magnetic assembly including a magnet disposed for reciprocable movement to create a moving magnetic field relative to said coil,

said coil configured to couple electrical energy to said battery contact upon relative movement between said magnet and coil,

wherein said assembly has a critical angle of displacement from a horizontal static position of less than 1 degree.

34. The battery charging system of claim 33, wherein said critical angle is less than 10 minutes.

35. An electrically operated device, comprising:

a housing arranged to be carried,

an electrical contact in said housing,

a conductor,

a support structure in said housing,

a magnet constrained by said support structure for movement relative to said support structure, and

a ferrofluid disposed between said magnet and support structure to provide a low friction interface,

said conductor arranged with respect to said magnet so that relative movement between the magnet and conductor generates an electrical signal in said conductor, said conductor connected to supply said energizing signal to said contact.

36. The device of claim 35, wherein said ferrofluid has a viscosity less than 5 centipoise.

37. The device of claim 35, wherein said ferrofluid comprises a light mineral oil medium mixed with isoparaffinic acid.

38. An electrically operated device, comprising:

a coil,

a housing arranged to be carried,

an electrical contact in said housing, and

a magnetic assembly in said housing including a magnet disposed for reciprocable movement to create a moving magnetic field relative to said coil,

said coil configured to couple electrical energy to said contact upon relative movement between said magnet and coil,

wherein said assembly has a critical angle of displacement from a horizontal static position of less than 1 degree.

39. The device of claim 38, wherein said critical angle is less than 10 minutes.

40. An environmental sensing system, comprising:

an environmental sensor arranged to produce an output signal indicative of an environmental condition,

a conductor,

a support structure,

a magnet contrained by said support structure for movement relative to said support structure, and

a ferrofluid disposed between said magnet and support structure to provide a low friction interface,

said conductor arranged with respect to said magnet so that relative movement between the magnet and conductor generates an energizing signal for said sensor.

41. The environmental sensing system of claim 40, said sensor including a transmitter energized by said energizing signal for transmitting a signal indicative of said environmental condition.

42. The environmental sensing system of claim 40, said sensor including a battery, said conductor connected to supply said energizing signal to said battery as a battery charging signal.

43. The environmental sensing system of claim 40, said conductor connected to supply said energizing signal to energize said sensor in real time.

44. The environmental sensing system of claim 40, further comprising a rectifying circuit, said conductor connected to supply said energizing signal to said sensor through said rectifying circuit.

45. The environmental sensing system of claim 40, wherein said ferrofluid has a viscosity less than 5 centipoise.

46. The environmental sensing system of claim 40, wherein said ferrofluid comprises a light mineral oil medium mixed with isoparaffinic acid.

47. An environmental sensing system, comprising:

an environmental sensor arranged to produce an output signal indicative of an environmental condition,

a coil, and

a magnetic assembly including a magnet disposed for reciprocable movement to create a moving magnetic field relative to said coil,

said coil configured to couple electrical energy to said sensor upon relative movement between said magnet and coil,

wherein said assembly has a critical angle of displacement from a horizontal static position of less than 1 degree.

48. The environment sensing system of claim 47, wherein said critical angle is less than 10 minutes.

49. An emergency transmitting system, comprising:

an emergency signal transmitter,

a conductor,

a support structure,

a magnet constrained by said support structure for movement relative to said support structure, and

a ferrofluid disposed between said magnet and support structure to provide a low friction interface,

said conductor arranged with respect to said magnet so that relative movement between the magnet and conductor generates an energizing signal for said transmitter.

50. The emergency transmitting system of claim 49, said transmitter including a battery, said conductor connected to supply said energizing signal to said battery as a battery charging signal.

51. The emergency transmitting system of calim 49, said conductor connected to supply said energizing signal to energize said transmitter in real time.

52. The emergency transmitting system of claim 49, further comprising a rectifying circuit, said conductor connected to supply said energizing signal to said transmitter through said rectifying circuit.

53. The emergency transmitting system of claim 49, wherein said ferrofluid has a viscosity less than 5 centipoise.

54. The emergency transmitting system of claim 49, wherein said ferrofluid comprises a light mineral oil medium mixed with isoparaffinic acid.

55. An emergency transmitting system, comprising:

an emergency signal transmitter,

a coil, and

a magnetic assembly including a magnet disposed for reciprocable movement to create a moving magnetic field relative to said coil,

said coil configured to couple electrical energy to said transmitter upon relative movement between said magnet and coil,

wherein said assembly has a critical angle of displacement from a horizontal static position of less than 1 degree.

56. The emergency transmitting system of claim 55, wherein said critical angle is less than 10 minutes.

57. A cellular telephone system, comprising:

a cellular telephone,

a conductor,

a support structure connected to said cellular telephone,

a magnet constrained by said support structure for movement relative to said support structure, and

a ferrofluid disposed between said magnet and support structure to provide a low friction interface,

said conductor arranged with respect to said magnet so that relative movement between the magnet and conductor generates an energizing signal for said cellular telephone.

58. The cellular telephone system of claim 57, said transmitter including a battery, said conductor connected to supply said energizing signal to said battery as a battery charging signal.

59. The cellular telephone system of claim 57, wherein said ferrofluid has a viscosity less than 5 centipoise.

60. The cellular telephone system of claim 57 wherein said ferrofluid comprises a light mineral oil medium mixed with isoparaffinic acid.

61. A cellular telephone system, comprising:

a cellular telephone,

a coil, and

a magnetic assembly including a magnet disposed for reciprocable movement to create a moving magnetic field relative to said coil,

said coil configured to couple electrical energy to said cellular telephone upon relative movement between said magnet and coil,

wherein said assembly has a critical angle of displacement from a horizontal static position of less than 1 degree.

62. The cellular telephone system of claim 61, wherein said critical angle is less than 10 minutes.

63. A method of generating electricity, comprising:

providing a low friction ferrofluid bearing for a magnet,

causing the magnet to move on said bearing with a reciprocating motion, and

using the magnet's motion to generate electricity.

64. The method of claim 63, wherein said ferrofluid has a viscosity less than 5 centipoise.

65. The method of claim 63, wherein said ferrofluid comprises a light mineral oil medium mixed with isoparaffinic acid.

66. A method of generating electricity, comprising:

providing a magnetic assembly that includes a magnet disposed for reciprocable movement, and has a critical angle of displacement from a horizontal static position of less than 1 degee,

causing the magnet to move relative to a coil with a reciprocating motion to create a reciprocating magnetic field, and

generating an electrical signal in said coil with said magnetic field.

67. The method of claim 66, wherein said critical angle is less than 10 minutes.